

**NATURAL RESOURCES CONSERVATION SERVICE
NEW JERSEY
CONSERVATION PRACTICE STANDARD**

FISH PASSAGE

(No.)

CODE 396

DEFINITION

Modification or removal of barriers that restrict or prevent movement or migration of fish.

PURPOSE

Allow upstream and downstream movement of fish past barriers where feasible or desirable.

CONDITIONS WHERE PRACTICE APPLIES

All rivers, streams, and outlets of ponds or lakes where barriers impede desired fish passage.

CRITERIA

GENERAL CRITERIA APPLICABLE TO ALL PURPOSES

All planned work shall comply with all federal, state, and local laws and regulations.

Actions taken to provide fish passage shall seek to avoid adverse effects to endangered, threatened, and candidate species and their habitats, as well as state species of concern, whenever possible. Refer to GM 190 ECS-Part 410.22 for actions affecting listed species.

Fish passage measures shall be designed so fish will not suffer excessive energy deficits or undue physical stress when swimming past a fish passage structure or site.

Fish passage shall be designed so that fish shall not be excessively delayed during passage at the structure or site unless modifications or removal of a barrier, such as a

tidegate, could result in undesirable effects to other resources.

Minimum and maximum flows through fish passage structures or sites must be adequate to attract target fish to, and through, the structure or site.

Location and overall design of fish passage structures or fish passage features shall:

- accommodate watershed conditions, such as variations in stream flow and bedload movement.
- accommodate different aquatic species and age classes to the extent possible.
- be compatible with local conditions and stream geomorphology.

Materials selected for constructing fish passage structures will be non-toxic to fish and other aquatic life.

At stream crossings, jump height below culverts and flow velocity through culverts should not exceed the abilities of those target species expected to move upstream and downstream of the site.

Modifications to dams to provide fish passage must be in accordance with existing laws and engineering specifications for dams.

CONSIDERATIONS

Native game and non-game fish species and other aquatic organisms as well as endangered, threatened, and candidate, rare and other sensitive species shall be carefully considered when designing and implementing fish passage features.

Conservation practice standards are reviewed periodically and updated as needed. The most current version of this standard can be obtained on our website at <http://www.nrcs.usda.gov/technical/efotg/>

**NRCS, NJFOTG
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Consider a stream simulation design for culverts at road crossings that incorporates natural streambed substrates.

Consider removal of the barrier or fish passage before installing a fish ladder. If removing a barrier, consider the quantity and quality of sediments stored upstream of a historic structure and the impact of re-suspending the sediments in the water column.

If replacement of an in-channel structure will cause degradation or aggradation of the channel upstream, installation of bed controls appropriate for the geomorphic conditions of the site and fish passage needs should be considered (see Stream Channel Stabilization –Code 584).

Consider potential negative effects of providing passage for invasive or non-native species that may hybridize with, compete with, or spread disease to native fish or other aquatic species above a barrier.

Consider other aquatic and terrestrial species, including endangered and threatened species that have established habitat in areas where barriers currently exist or in upstream and downstream areas that would be directly affected by the action.

Consider the amount of habitat both upstream and downstream of a barrier and the potential for connectivity of important habitats for fish species of concern.

Consider seasonal variations in headwater and tailwater levels and how these may impact passage hydraulics for the life history stages of the fish for which the structure is being designed.

Consider the need to prevent entrainment of fish, particularly juveniles, in irrigation diversions by installing screens.

Consider the need to design for strategic resting places for target species facing long passages.

Consider historical structures when planning. This practice may affect cultural resources and should comply with GM 420, Part 401, during planning, prior to installation and during maintenance of fish passage structures.

Consider the need to balance fish passage with other water management objectives.

To the extent possible, fish passage structures should be designed to minimize excessive predation on fish entering or exiting the structure.

Removal of a fish passage barrier should take into consideration effects on wetlands, flooding potential, existing infrastructure and social impacts.

Consider bypassing the barrier by restoring a historical channel or creating a new channel that is geomorphically stable and provides a more natural fish passage.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Plans and specifications shall be in keeping with this practice and shall describe the details adequately to apply the practice to achieve its intended purpose of improving conditions for a diverse and healthy aquatic ecosystem. The plans and specifications should address the following five common conditions that create fish migration barriers:

- Excess drop at outlet
- High velocity within the structure
- Inadequate depth within the structure
- High velocity and/or turbulence at the structure inlet
- Turbulence within the structure
- Debris accumulation at the inlet

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be developed for all applications. The plan shall provide for periodic inspection and prompt repair should fish passage become impaired or inoperable at the structure or site.

REFERENCE

WDFW. Upstream fish passage at dams and culverts. Washington Department of Fish and Wildlife. <http://www.wa.gov/wdfw/hab/engineer/habeng.htm>